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ABSTRACT

The aim of this study was to document the development of illness and health causality concepts in young hospitalized children (ages 4-10 years) whose stage of cognitive development may limit understanding of illness and treatment. It was hypothesized that distinct qualitative levels would characterize children's conceptions of illness and that these qualitative transitions would parallel other indices of cognitive growth such as conservation, decentration and physical causality. A total of 61 hospitalized children in three age groups (5, 7, and 9 years) were administered a number of tasks (designed to assess intellectual functioning, conservation, role taking skills, physical causality, and causality of illness). A significant age progression was observed, with these concepts, involving a shift from global, undifferentiated to increasingly abstract principles. Children's conceptions of illness causality were also significantly related to performance in conservation, role taking and physical causality tasks. The practical significance of this research in the context of the ill and hospitalized child is discussed. (Author/SB)

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CONCEPTIONS OF ILLNESS CAUSALITY IN HOSPITALIZED CHILDREN

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This research was conducted while the first author was a faculty member of the Department of Pediatrics, University of Rochester School of Medicine and Dentistry, Rochester, New York. Appreciation is expressed to the Department of Pediatrics and the nursing staff for their cooperation in the conductance of this study. An earlier version of this paper was presented at the biennial meeting of the Society for Research in Child Development, Denver, 1975. Rune J. Simeonsson's adress: Frank Porter Graham Child Development Center, University of North Carolina at Chapel Hill, Highway 54 Bypass West, Chapel Hill, North Carolina 27514.

ABSTRACT

Hospitalized children (N = 61) in three age groups (5, 7, 9) were administered a number of tasks to explore their conceptions of illness and health and to assess development of physical and social concepts. A significant age progression was observed, with these concepts, involving a shift from global, undifferentiated to increasingly abstract principles. Children's conceptions of illness causality were also significantly related to performance in conservation role taking and physical causality tasks. The practical significance of this research in the context of the ill and hospitalized child is discussed.

HOSPITALIZED CHILDREN'S CONCEPTION OF ILLNESS

Charting the developmental characteristics of children's understanding of illness and health might make important contributions to the applied context of pediatric care. Earlier work has provided anecdotal descriptive information of children's hospital experiences (Adams & Berman, 1965), examined correlates of child health attitudes and beliefs (Mechanic, 1964; Goochman, 1971), and compared mother-child conceptions of illness (Campbell, 1975), but little has been done, however, to explore the stage-related development of illness concepts, paralleling earlier investigations of such concepts as life and consciousness (Piaget, 1929), prayer and religious identity (Elkind, 1962, 1967), and death (Koocher, 1974; Childers & Wimmer, 1971). The aim of the present study was to document the development of illness and health causality concepts in young hospitalized children (ages 4-10 years) whose stage of cognitive development may limit understanding of illness and treatment. It was hypothesized that distinct qualitative levels would characterize children's conceptions of illness and that these qualitative transitions would parallel other indices of cognitive growth such as conservation and decentration.

Method

Subjects

Subjects were 30 boys and 31 girls (4 yr. 0 mos. to 9 yrs. 11 mos.) admitted to a university teaching hospital. None of the subjects were acutely or terminally ill, and all were judged to be capable of responding to task demands.

Materials and Procedure

The Concept Assessment Kit (CAK; Goldschmid & Bentler, 1968) Form A, was administered to assess conservation. The role-taking skills of children

were assessed by administering a set of five cartoon drawings described previously by Chandler (1973). Cards are scored from 0 to 3, with a high score (maximum = 15) indicating egocentrism. Seven questions were administered to elicit the child's response to questions of causality. The first utilized Piaget's (1930) question: (a) "What makes clouds move?" to probe notions of physical causality. Six additional questions tapping causality of illness were constructed as follows: (b) "How can children keep from getting sick?" (c) "What does medicine do?" (d) "How do children get sick?" (e) "How do children get stomach aches?" (f) "How do children get bumps or spots?" (g) "When children are sick, how do they get better again?" Half of the children were presented only verbal questions whereas for the other half, verbal questions were accompanied by appropriate illustrations (e.g., pictures of medicine, child in a hospital bed, etc.) to determine if mode of presentation would influence response quality. The scoring criteria involved the assignment of responses to one of three defined stages (Elkind, 1967): stage I (global or undifferentiated responses including "don't know"), stage II (concrete, specific responses reflecting rule breaking, rule keeping and/or specific acts and events), stage III (abstract verbalizations or expression of principle). Inter-rater reliability on 23 protocols was 86% agreement.

Each child was first administered a receptive language test (PPVT; Dunn, 1965) to ascertain that an estimate of intellectual functioning fell above 85 IQ. Subjects then completed the six CAK subtests followed by causality questions which were interspersed with items from the role-taking task.

Selected responses illustrate the content of children's responses as they reflect qualitatively scored stages. Stage 1. Responses scored for this

stage reflected global and undifferentiated conceptions of illness and health. In response to the question "what does medicine do", a boy (5-9) responded "sometimes kills them." To the question "how do children get sick", one girl (5-8) suggested "when you kiss old people and women," another girl (4-10) responded "when they need pills." The above three examples suggest that conceptions of illness causality at this stage are undifferentiated, magical and superstitious, (first two responses) and/or reflect circularity of reasoning in which cause and effect become confused (last response). Stage 2. Responses were scored according to the presence of concrete and specific conceptions of illness in this stage. A boy (6-1) responded to "how do children get sick" by stating "peanuts goes in the wrong pipe, getting finger cut, getting electrocuted." A girl (6-3) given the same question, responded "go to the medicine cabinet and take medicine you're not supposed to, eat poison." These responses are typical of many stage 2 responses in that they reflected conceptions dealing with the violation and/or observation of specific rules. Causality of illness and health was often associated with the enumeration of acts or events without the presence of an organizing or generalizing principle. Stage 3. Responses were assigned tc this stage when there was evidence of an abstract and/or generalizable principle. A boy (9-4) suggested in response to the question "when sick, how do children get better again", "take medicine and do what the doctor tells you to." Another boy (8-4) responded to the question "how do children get sick" by saying, "sometimes you catch it from other people from germs." These two responses illustrate a relative understanding of disease states and treatment and suggest awareness of causal factors for illness which extend beyond specific acts, events, and/or violation of rules.

Results

The data are reviewed first by focusing upon the developmental nature of illness and health concepts and secondly by examining the relationship between these concepts and the cognitive indices of conservation, role-taking and physical causality concepts. Subjects were selected to constitute approximately equal numbers of boys and girls in three age groups (4-5/11; 6-7/11; 8-9/11).

All of the responses on illness and health causality were classifiable into one of the levels specified previously. Mean scores for each of the six illness conception questions are given in Table 1. Multivariate analysis of variance (Presentation Mode X Age X Questions) revealed

Insert Table 1 about here

neither the effects for presentation or the presentation X age interaction reached the $p<.05$ significance level.

A significant multivariate effect however, was found for age ($F=2.58$, $p<.005$). Examination of univariate F tests indicated that four of the six illness causality questions reflected significant age effects. These questions were, how do children: (b) keep from getting sick ($F=11.55$, $df=2,55$, $p<.001$); (d) get sick ($F=6.93$, $df=2,55$, $p<.002$); (e) get stomach aches ($F=5.75$, $df=2,55$, $p<.005$); and (g) get better ($F=7.35$, $df=2,55$, $p<.001$). These findings not only suggest developmental differences in children's illness causality conceptions but also that some questions are more developmentally sensitive than others. Inspection of the table shows minimal mean age differences for questions (c) what does medicine do and (f) how do children get spots/bumps whereas more distinct transitions are evident for the remaining questions. It appears that questions dealing with causes for illness and stomach aches as well as conditions identified for recovery or the maintenance of health are most sensitive to developmental differences in the age range tested.

Support for a developmental progression was evident in that stage 1 responses characterized 41% of all responses of five-year-olds whereas it dropped to 22% and 9% for the two older age groups. Stage 2 responses accounted for 59%, 74%, and 83% of all responses for the five-, seven, and nine-year age groups respectively. Stage 3 responses, on the other hand, were non-existent for the youngest population and accounted for only small percentages (4 & 8) in the middle and oldest age group. It thus appears that children's conceptions of illness causality meet basic criteria for stages with evidence of uniformity of response and progression from global to abstract with age.

Table 2 presents the mean scores of the three age groups on conservation, role-taking, total illness and physical causality. Conservation and role taking scores reflect developmental differences for age groups whereas scores for physical causality concepts did not.

Insert Table 2 about here

A correlation matrix was constructed to clarify the relationships between variables examined in this study (Table 3). Mean illness conception scores correlated significantly with measures of egocentrism, conservation, and chronological age. Furthermore, an overall trend of qualitative shifts in cognition, whether it involved physical aspects (i.e. conservation of space and number), social cognition (role taking) or conceptions of phenomena such as illness and health, is supported by the substantial intercorrelations among these measures as well as with the developmental index of chronological age. The commonality of cognitive growth across

measures is further supported by first-order partial correlations in which the effect of chronological age is controlled. These partial correlations were as follows between illness conception and: conservation, $r = .33$ ($p < .005$); egocentrism $r = -.43$ ($p < .001$); physical causality $r = .29$ ($p < .01$).

Insert Table 3 about here

Discussion

The results have shown that the conceptions of illness of children follow a developmental progression of stages similar to that reported for other domains (Piaget, 1929; Koocher, 1974; Elkind, 1962, 1967).

The first stage was global and undifferentiated in its structure and reflected responses which were magical, superstitious and/or circular in their logic. The magical and circular aspects of reasoning have been pointed out by Piaget (1930) to be characteristic of young children in areas of causality and moral j dgment. At the second stage, causality of illness was attributed to a variety of specific acts and/or events associated with illness and health. An association was very frequently made between becoming ill or getting well and the enumeration of breaking or keeping rules and regulations. This focus is in keeping with Piaget's (1932) and Kohlberg's (1963) proposed stages of moral judgment in which evaluations by the young child are strongly based on respect for authority and rules. The third stage of illness conceptions provided evidence for generalized, relative and/or abstract notions in that the phenomena of illness or health were generalized to basic concepts of infection, health maintenance, differentiated and relative bases for treatment.

The predominance of stage 1 and stage 2 responses in this study can perhaps be explained by the restricted age range. It is clear that only a small portion of the nine year old group were demonstrating consistent stage 3 responding. Comparison of findings from this study with those of Elkind (1962) and Koocher (1974) suggests that conceptions of illness by the typical eleven or twelve year old would, most likely, demonstrate the abstract quality acceptable for adequate communication at an adult level. The specific intent of this study, however, to probe the understanding of the young child for whom illness and hospitalization may be difficult to deal with, has been met through documentation of stage 1 and 2 responses.

The demonstration that illness causality conceptions were significantly related to conservation, decentration, and physical causality provides generalized support for the commonality of cognitive development across a range of phenomena. It suggests that conceptual development is characterized by the child's increasing ability to free himself of egocentric and intuitive reasoning in the domains of physical, social and personal experiences.

A major contribution of Piaget (1970), and research based on his theory, has been to sensitize us to the fact that children at every stage of development actively construct the world in order to understand it and thereby cope with it accordingly. The demonstration that children's conceptions of causality of illness and health show marked qualitative shifts in development is not an unexpected finding. Parents, nurses and doctors often ask the child to be a "good patient." Perhaps it is of greater importance, to explore how the child perceives himself to be a "patient" and to provide him with information about treatment which is consistent with his level of understanding. This may be particularly true for hospitalized children under six or seven whose conceptions are prone to be egocentric, magical and/or superstitious and who,

therefore, lack not only a realistic understanding of illness but also of their role as patients in the treatment process. Further explorations of children's conceptions of illness and health are needed to form a basis for more effective patient-staff relationships to enhance the child's participation in treatment, an essential aspect of the recovery process.

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Table 1

Mean Illness Scores

Age Group	Questions: Keep Well	Medicine	Get Sick	Stomach Ache	Spots/ Bumps	Get Better
Five	1.45	1.80	1.60	1.45	1.45	1.65
Seven	1.96	1.85	1.95	1.63	1.63	1.90
Nine	2.09	1.85	2.20	1.90	1.76	2.10

Table 2

Mean scores for total illness and cognitive measures

	Age Group: Five	Seven	Nine
Conserv.	1.48	5.80	9.05
Egocent.	9.10	7.60	3.09
Causality	3.24	3.55	3.55
Total Illness	1.57	1.82	1.98

Table 3

Intercorrelation of variables

	CA	Conserv.	Egoc.	Phys. Causal.	Total Illness
CA		.62[c]	-.52[c]		.54[c]
Conserv			-.40[c]	.25[a]	.55[c]
Egoc.					-.59[c]
Phys. Causal.					.33[b]
Total Illness					

a p .05

b p .005

c p .001